

Claims

1. Apparatus for the illumination of the vestibular/lingual cavity, characterised in that it comprises a symmetrical couple of retractors (A,B) for the oral cavity, each retractor having a series of punctiform light sources distributed thereon and deriving each from a corresponding termination, on the external surface of the retractor, of an
5 optical fibre tilted according to a specific angle with respect to an ideal plane as determined in the closed condition of the set of teeth, the apparatus producing a complete, uniform and close illumination from the inside of the mouth, both from the lingual side and from the vestibular side of each tooth; said couple of retractors being located on a support structure (7) arranged according to an Y-like configuration, and
10 said structure providing at the same time an inlet, through its lower termination, of optical fibres that branch off on the first (A) and second (B) retractor; the apparatus comprising also regulation means for the adaptation of the normal or initial opening of the retractor through the introduction in said support structure of a semirigid small-bow, the latter being selected from an available set according to the typology
15 of oral cavity on which the operation is to be performed and according to the kind of operation.
2. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, characterised in that the symmetric retractors (A,B), forming by themselves
20 illuminators of the vestibular/lingual cavity, are configured according to an external arcuated profile, in their longitudinal section, and are moreover provided with a channel (1) on said external profile, said channel extending along the whole length of said arcuated profile and being apt to receive lateral portions of the mouth and part of the upper and lower lips of the patient; said channel extending at a lower section
25 (2b', 2b'') and at an upper section (2a', 2a''), starting from the arcuated line that forms said external profile of the retractor, so as to form a respective rectilinear

portion representing a half-line, onto which part of the upper lip and part of the lower lip abut in a stable and uniform manner.

3. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, characterised in that the optical fibres which end on the surface (6') of the retractor, have differing tilts with respect to a hypothetical plane taken while the set of teeth is in its closed condition, said fibres being however arranged equidistantly, both from the inside to the outside and from top to bottom, taking account of the visualisation requirement of the operation field both in the closed and in the opened condition of the set of teeth.
4. Apparatus for the illumination of the vestibular/lingual cavity according to claims 1 and 3, wherein three zones are selected for the arrangement of the punctiform light sources on the surface (6') of the retractors:
- a first series (3) of outgoing optical fibres being arranged in the projecting and more external part of the retractor, almost at the limit of the edge of the channel (1), to effectively illuminate, in the first place, from this position, the bottom of the lingual/vestibular cavity and in particular the molar teeth;
 - a further series of outgoing optical fibres corresponding to points (4) located in an intermediate zone of the inner plane of the retractor, said points being suited to illuminate the premolars, and
 - a further series of light points, or punctiform light sources (5), being arranged approximately at the inner surface of the projecting structure of the retractor, in order to illuminate the incisive teeth and the median lines.

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5. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, wherein the apparatus further includes a pen-like device (14), used for stretching and moving the cheek out of the way, which includes a grip portion (14a) and, at the

- opposite end (14b), a curvilinear portion which is bent backwards and which has a flattened cross section, in such a way that the inner surface of the portion that is bent backwards can perfectly fit together with the surface of the retractor, the curvature profile of said end which is bent backwards and which belongs to said pen-like device accurately matching the profile of the retractor.
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6. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, wherein a set of small bows (11) is available to the apparatus, each of them being suited to a corresponding type of oral cavity, and to a respective small-size, medium-size, or large-size opening of the mouth on which the operation is to be carried out.
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7. Apparatus for the illumination of the vestibular/lingual cavity according to claims 1 and 6, wherein some of the available small bows have not the same length and/or do not cause the same opening-out on the two opposite sides thereof, and are employed in operations requiring, in order to open out the oral cavity, a specific asymmetric bias on only one side of the patient's mouth.
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8. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, wherein the apparatus is used as an endoscopic lamp to optimise the visualisation of inter-proximal caries and to permit the examination of the tooth through the transmitted light, when it is positioned behind the tooth in order to diagnose micro-fractures of the tooth or implants contained therein.
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9. Apparatus for the illumination of the vestibular/lingual cavity according to claim 1, wherein the apparatus is used as a polymerising, that is as a curing lamp, having a diode which emits cold light to cause hardening of composites, the apparatus being provided with a stopwatch specific for the regulation of the composites' hardening.
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10. Apparatus for the illumination of the vestibular/lingual cavity according to claim
1, wherein, when the apparatus is used in operations employing the “dam-technique”,
the mini-illuminator is configured in such a way that the optical fibres are arranged
on the dam-stretching frame which normally is formed of thermoplastic material and
5 has a U-shape.